

REMARKS

The Office Action mailed on August 13, 2002 has been received and its contents have been carefully reviewed. Claims 1 and 5 have been amended. Claims 1-2 and 4-21 are pending in this application. Of these claims, claims 1-2, 4-8, 10-11, 13, 15-18 and 21 are pending for consideration on the merits, with the other claims being withdrawn at this time.

Applicants appreciate the personal interview with Examiner Atkinson on December 11, 2002. The substance of that interview is provided in the Interview Summary of that date, which is of record in the present application. Applicants understand that the present amendment to the claims overcomes the current rejection of the claims.

In the present Office Action, claims 1-2, 4, 13, 15, 18, and 21 stand rejected under 35 U.S.C. § 103 as obvious based on JP 4-244596 to Ikagawa ("Ikagawa") in view of U.S. Patent No. 5,868,198 to Kato ("Kato '198"). Applicants respectfully traverse this rejection below.

Claims 1 and 5 have both been amended to recite "said insertion section having substantially parallel side edges and a constant thickness." This structure for the insertion section specifically provides the advantage that the header member position can be controlled as desired by displacing the header member relative to the insertion section. Neither this recited structure, nor its attendant advantage is suggested by either Ikagawa or Kato '198.

Ikagawa discloses a side plate 11 with a front end 13 which fits into an insertion hole 15 of a header 2. Even if the front end 13 of the side plate 11 of Ikagawa could be considered to correspond to the insertion section of the claims, Ikagawa does not suggest the recited structure of the insertion section of claims 1 and 5. The Ikagawa structure includes tapered edges 13b at the end portion 13. Thus, end portion 13 is not of a constant thickness. As best understood, with the structure in Ikagawa, the end portion 13 fits into the insertion hole 15 at a particular point where the end portion meets a tapered shape of the hole coinciding with the end portion shape (see paragraph 11). With Ikagawa one

cannot control the header member position relative to the insertion section, i.e., how far the insertion section extends into the header member. In short, Ikagawa neither discloses the structure of the insertion section as recited in claims 1 and 5, nor the attendant advantage of this structure where the header member position can be controlled as desired by displacing the header member relative to the insertion section.

Kato also does not disclose an insertion section with the recited structure of claims 1 and 5. In Kato, the side plates 8 have purely angled edges to be fit into holes 10 in header pipes 3 and 4 (col. 3, lines 33-36). Even if the ends of the side plates 8 could be considered to correspond to the insertion sections of claims 1 and 5, Kato does not suggest the invention of claims 1 or 5, because the ends of the side plates have angled side edges. Like the Ikagawa structure, the side plates of Kato appear to fit into holes of corresponding headers at a particular fixed extent. Thus, like Ikagawa, Kato does not recognize or suggest the advantage where the header member position can be controlled as desired by displacing the header member relative to the insertion section.

In addition, the Office Action has rejected claims 5-8, 10-11 and 16-17 under section 103 based on the same art as applied to claim 1, further in view of GB Patent Document No. 2,064,751 to Hooton ("Hooton") and U.S. Patent No. 5,535,819 to Matsuura ("Matsuura"). Applicants submit that Hooton and Matsuura also fail to disclose the recited structure of claims 1 and 5, and thus do not cure the deficiencies of Ikagawa and Kato '198.

The claims are patentable for additional reasons. Independent claim 1 recites a width of the insertion member "smaller than a width of said reinforcement hole as well as larger than a length of the linear section so that said insertion section is inserted into said reinforcement hole by press-fitting." Thus, the width of the insertion member is: (1) smaller than a width of the reinforcement hole, and (2) larger than a length of the linear section. Neither of the references of Ikagawa or Kato, either alone or in combination, suggests this feature of independent claim 1.

Assuming for the sake of argument that Kato discloses holes 10 with continuous circular arch sections, Kato discloses, as can be seen from Figure 2, that the

width of the side plates 8 are larger than either any linear section of the holes 10 or the holes 10 themselves. Specifically, the side plates 8 of Kato fit into the holes 10 up to a region at the ends of the side plates which are tapered. Because the widths of the side plates are larger than the width at this taper, the widths of the side plates 8 must be larger than the widths of the holes 10.

In Ikagawa, the side plate 11 widths appear to be smaller than all portions of the insertion holes 15. In any event, Ikagawa does not disclose that the side plate widths are larger than any portion of the insertion holes. Thus, Ikagawa cannot suggest that the width of an insertion member is larger than a length of a linear section of a reinforcement hole, and thus Ikagawa is not combinable with Kato. Furthermore, even if Ikagawa and Kato could be properly combined, the combination would not suggest the invention as recited in claim 1, because Kato suggests that in the case of insertion holes with side arch sections, the width of the side plates should be larger than the holes.

With respect to claim 5, the Office Action asserts that Matsuura discloses in Figure 20 a reinforcement member with a width smaller than that of the fins. This assertion does not appear to be accurate. Matsuura discloses in Figure 20, fins 3 and side plate 6 of the same width. Thus, even if Matsuura could be properly combined with Hooton, Ikagawa and Kato, the combination would lack at least one feature of the claim 5.

For the reasons given above, applicants submit that claims 1 and 5, and the claims depending therefrom, are patentable over Ikagawa, Kato '198, Hooton and Matsuura.

CONCLUSION

In view of the foregoing, it is respectfully urged that the present claims are in condition for allowance. An early notice to this effect is earnestly solicited. Should there be any questions regarding this application, the Examiner is invited to contact the undersigned at the number shown below.

Respectfully submitted,

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Date

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THE COMMISSIONER IS HEREBY AUTHORIZED TO CHARGE ANY DEFICIENCY OR CREDIT ANY OVERPAYMENT TO DEPOSIT ACCOUNT NO. 19-0741.

Versions with Markings to Show Changes Made

In the Claims:

1. (Three Times Amended) A heat exchanger core comprising:
a pair of header members being spaced with a predetermined clearance therebetween and disposed opposite to each other;
tubes and corrugated fins which are interposed between said pair of header members and are arranged alternately; and
a reinforcement member being provided on ends of said mutually-opposing header members,
wherein each of said header members has tube holes into which ends of said tubes are fixedly inserted and reinforcement holes into which ends of said reinforcement members are fixedly inserted,
wherein each of said reinforcement holes is formed so as to be of the same size as or larger than each of said tube holes, and
wherein an interval between said reinforcement hole and said tube hole adjacent to said reinforcement hole is made equal to an interval between adjacent tube holes,
wherein said reinforcement hole comprises continuous circular-arch sections being formed at both ends thereof in a thickness direction and a linear section being formed between said circular-arch sections, and
wherein an insertion section is formed at an end of said reinforcement member so as to have an end face being rectangular in cross section and be fixedly inserted into said reinforcement hole, ^(na) said insertion section having substantially parallel side edges and a constant thickness, and a width of said insertion section is made smaller than a width of said reinforcement hole as well as larger than a length of the linear section so that said insertion section is inserted into said reinforcement hole by press-fitting.

5. (Twice Amended) A heat exchanger core comprising:
a pair of header members being spaced with a predetermined clearance therebetween and disposed opposite to each other; and
tubes and corrugated fins which are interposed between said pair of header members and are arranged alternately,

a reinforcement member being provided on ends of said mutually-opposing header members,

wherein each of header members has tube holes into which ends of said tubes are fixedly inserted and reinforcement holes into which ends of said reinforcement members are fixedly inserted, said reinforcement member comprises a reinforcing section having a C-shaped cross section and insertion sections which are integrally formed with opposite ends of said reinforcing section, said insertion section having substantially parallel side edges and a constant thickness, a width of said reinforcement member is smaller than a width of said corrugated fin, and a width of said tubes is smaller than said width of said corrugated fin.